

What is claimed is:

1. An apparatus for speech recognition, comprising:
 - an acoustic processor, wherein said acoustic processor converts analog speech input signals into digital signals;
 - a first storage structure, wherein said first storage structure stores an acoustic model which has learned voice characteristics;
 - a second storage structure, wherein said second storage structure stores a dictionary containing a first language model which has been trained regarding disfluency words and non-disfluency words, and a second language model which has been trained regarding non-disfluency words and trained to ignore disfluency words;
 - and
 - a probability calculator, wherein said probability calculator calculates a probability regarding said digital signals using said acoustic model and said dictionary to recognize words showing the highest probability of representing said input signals.
2. The apparatus for speech recognition according to claim 1, wherein said first and second language models are N-gram models.

1 3. A computer system, comprising:
2 an input receiver, wherein said input receiver inputs analog speech;
3 a processing converter, wherein said processing converter converts said analog
4 speech into digital signals;
5 a first storage structure, wherein said first storage structure stores an acoustic
6 model which has learned voice characteristics;
7 a second storage structure, wherein said second storage structure stores a
8 dictionary containing a first language model which has been trained regarding
9 disfluency words and non-disfluency words, and a second language model which has
10 been trained regarding non-disfluency words and trained to ignore disfluency words;
11 a probability calculator for calculating a probability regarding said digital signals
12 using said acoustic model and said dictionary to recognize words showing the highest
13 probability of representing said analog speech; and
14 a display apparatus for displaying results of said recognition.

1 4. The computer system according to claim 3, wherein said first and second
2 language models are N-gram models.

1 5. A method for speech recognition, comprising the steps of:
2 converting analog speech input signals into digital signals;
3 storing a dictionary containing a first language model which has been trained
4 regarding disfluency words and non-disfluency words, and a second language model
5 which has been trained regarding non-disfluency words and trained to ignore disfluency
6 words; and
7 calculating a probability regarding said digital signals using said acoustic model
8 and said dictionary to recognize words showing the highest probability of representing
9 said input signals.

1 6. The method for speech recognition according to claim 5, wherein said first and
2 second language models are N-gram models.

1 7. A method for speech recognition, comprising the steps of:
2 receiving analog speech input;
3 converting said analog speech into digital signals;
4 storing a dictionary containing a first language model which has been trained
5 regarding disfluency words and non-disfluency words, and a second language model
6 which has been trained regarding non-disfluency words and trained to ignore disfluency
7 words;
8 calculating a probability regarding said digital signals using said acoustic model
9 and said dictionary to recognize words showing the highest probability of representing

10 said speech input; and
11 displaying results of said recognition.

1 8. The method for speech recognition according to claim 7, wherein said first and
2 second language models are N-gram models.

1 9. A storage medium readable by a computer containing a computer program, said
2 storage medium storing an acoustic model and storing a dictionary containing a first
3 language model which has been trained regarding disfluency words and non-disfluency
4 words, and a second language model which has been trained regarding non-disfluency
5 words and trained to ignore disfluency words, wherein said computer program is
6 designed to calculate a probability regarding digital signals converted from analog
7 speech signals inputted into said computer using said dictionary to recognize words
8 showing the highest probability of representing said analog speech signals.

1 10. The storage medium according to claim 9, wherein said first and second
2 language models are N-gram models.

1 11. A storage medium for storing a dictionary comprising a first language model
2 which has been trained regarding disfluency words and non-disfluency words, and a
3 second language model which has been trained regarding non-disfluency words and
4 trained to ignore disfluency words.

12. The storage medium according to claim 11, wherein said first and second language models are N-gram models.

13. An apparatus for recognizing speech from texts comprising disfluency words and non-disfluency words, said apparatus comprising:

a first judging processor, wherein said first judging processor judges whether words inputted as an object of recognition are non-disfluency words;

a second judging processor, wherein said second judging processor judges whether said inputted words constituting a condition necessary for recognizing said inputted words consist of only non-disfluency words, if said inputted words have been judged to be non-disfluency words by said first judging processor; and

a first probability calculator, wherein said first probability calculator calculates a probability, if said conditional words have been judged as containing non-disfluency words and disfluency words by said second judging processor, by using a dictionary containing a first language model which has been trained regarding disfluency words and non-disfluency words, and a second language model which has been trained regarding non-disfluency words and trained to ignore disfluency words so as to recognize words showing the highest probability of representing said inputted words.

1 14. The apparatus for speech recognition according to claim 13, further comprising:
2 a second probability calculator, wherein said second probability calculator
3 calculates said probability based on said first language model, if said object words have
4 been judged as not being non-disfluency words by said first judging processor.

1 15. The apparatus for speech recognition according to claim 13, further comprising:
2 a third probability calculator, wherein said third probability calculator calculates
3 probability based on said second language model, if said conditional words have been
4 judged as containing only non-disfluency words by said second judging processor.

1 16. The apparatus for speech recognition according to claim 14, further comprising:
2 a third probability calculator, wherein said third probability calculator calculates
3 said probability based on said second language model, if said conditional words have
4 been judged as containing only non-disfluency words by said second judging processor.

1 17. The apparatus for speech recognition according to claim 13, said first probability
2 calculator further comprising:

3 a third judging processor, wherein said third judging processor judges whether a
4 word immediately preceding said object word is a disfluency word; and

5 a fourth probability calculator, wherein said fourth probability calculator
6 calculates said probability based on said first and said second language models, if said
7 preceding word has been judged a disfluency word by said third judging processor.

1 18. The apparatus for speech recognition according to claim 14, said first probability
2 calculator further comprising:

3 a third judging processor, wherein said third judging processor judges whether a
4 word immediately preceding said object word is a disfluency word; and

5 a fourth probability calculator, wherein said probability calculator calculates said
6 probability based on said first and said second language models, if said preceding word
7 has been judged to be a disfluency word by said third judging processor.

1 19. The apparatus for speech recognition according to claim 15, said first probability
2 calculator further comprising:

3 a third judging processor, wherein said third judging processor judges whether a
4 word immediately preceding said object word is a disfluency word; and

5 a fourth probability calculator, wherein said probability calculator calculates said
6 probability based on said first and said second language models, if said preceding word
7 has been judged to be a disfluency word by said third judging processor.

1 20. The apparatus for speech recognition according to claim 17, further comprising a
2 fifth probability calculator, wherein said fifth probability calculator calculates said
3 probability based on said second language model, if said preceding word has been
4 judged as not being a disfluency word by said third judging processor.

1 21. The apparatus for speech recognition according to claim 18, further comprising a
2 fifth probability calculator, wherein said fifth probability calculator calculates said
3 probability based on said second language model, if said preceding word has been
4 judged as not being a disfluency word by said third judging processor.

1 22. The apparatus for speech recognition according to claim 19, further comprising a
2 fifth probability calculator, wherein said fifth probability calculator calculates said
3 probability based on said second language model, if said preceding word has been
4 judged as not being a disfluency word by said third judging processor.

1 23. A method for recognizing speech from texts comprising disfluency words and
2 non-disfluency words, comprising the steps of:

3 (a) judging whether words inputted as an object of recognition are non-disfluency
4 words;

5 (b) judging further whether said words constituting a condition necessary for
6 recognizing said input words consist only of non-disfluency words, if said inputted words
7 have been judged to be non-disfluency words in said step (a); and

8 (c) calculating a probability, if said conditional words have been judged as
9 comprising non-disfluency words and disfluency words in said step (b), by using a
10 dictionary containing a first language model which has been trained regarding
11 disfluency words and non-disfluency words, and a second language model which has
12 been trained regarding non-disfluency words and trained to ignore disfluency words so

13 as to recognize words showing the highest probability of representing said input words.

1 24. The method for speech recognition according to claim 23, further comprising the
2 step of:

3 calculating said probability based on said first language model, if said object
4 words have been judged as not being non-disfluency words in said step (a).

1 25. The method for speech recognition according to claim 23, further comprising the
2 step of:

3 calculating said probability based on said second language model, if said
4 conditional words have been judged as consisting only of non-disfluency words in said
5 step (b).

1 26. The method for speech recognition according to claim 24, further comprising the
2 step of:

3 calculating said probability based on said second language model, if said
4 conditional words have been judged as consisting only of non-disfluency words in said
5 step (c).

1 27. The method for speech recognition according to claim 23, said step (c) further
2 comprising the steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,
6 if said preceding word has been judged to be a disfluency word in said step (d).

1 28. The method for speech recognition according to claim 24, said step (c) further
2 comprising the steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,
6 if said preceding word has been judged to be a disfluency word in said step (d).

1 29. The method for speech recognition according to claim 25, said step (c) further
2 comprising the steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,
6 if said preceding word has been judged to be a disfluency word in said step (d).

1 30. The method for speech recognition according to claim 26, said step (c) further
2 comprising the steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,
6 if said preceding word has been judged to be a disfluency word in said step (d).

1 31. The method for speech recognition according to claim 27, further comprising the
2 step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 32. The method for speech recognition according to claim 28, further comprising the
2 step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 33. The method for speech recognition according to claim 29, further comprising the
2 step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 34. The method for speech recognition according to claim 30, further comprising the
2 step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 35. A storage medium readable by a computer containing a computer program to
2 recognize speech from texts comprising disfluency words and non-disfluency words,
3 said computer program being designed to make the computer perform the following
4 steps:

5 (a) judging whether words inputted as an object of recognition are non-disfluency
6 words;

7 (b) judging further whether said words constituting a condition necessary for
8 recognizing said inputted words consist only of non-disfluency words, if the inputted
9 words have been judged to be non-disfluency words in said step (a); and

10 (c) calculating a probability, if said conditional words have been judged as
11 comprising non-disfluency words and disfluency words in said step (b), by using a
12 dictionary containing a first language model which has been trained regarding
13 disfluency words and non-disfluency words and a second language model which has
14 been trained regarding non-disfluency words and trained to ignore disfluency words so
15 as to recognize words showing the highest probability of representing said inputted
16 words.

1 36. The storage medium according to claim 35, wherein said computer program is
2 designed to make the computer execute the additional step of:

3 calculating said probability based on said first language model, if said object
4 words have been judged as not being non-disfluency words in said step (a).

1 37. The storage medium according to claim 35, wherein said computer program is
2 designed to make the computer execute the additional step of:

3 calculating said probability based on said second language model, if said
4 conditional words have been judged as consisting only of non-disfluency words in said
5 step (b).

1 38. The storage medium according to claim 36, wherein said computer program is
2 designed to make the computer execute the additional step of:

3 calculating said probability based on said second language model, if said
4 conditional words have been judged as consisting only of non-disfluency words in said
5 step (b).

1 39. The storage medium according to claim 35, wherein said computer program is
2 designed to make the computer execute the additional steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,

6 if said preceding word has been judged to be a disfluency word in said step (d).

1 40. The storage medium according to claim 36, wherein said computer program is
2 designed to make the computer execute the additional steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,
6 if said preceding word has been judged to be a disfluency word in said step (d).

1 41. The storage medium according to claim 37, wherein said computer program is
2 designed to make the computer execute the additional steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,
6 if said preceding word has been judged to be a disfluency word in said step (d).

1 42. The storage medium according to claim 38, wherein said computer program is
2 designed to make the computer execute the additional steps of:

3 (d) judging whether a word immediately preceding said object word is a
4 disfluency word; and

5 calculating said probability based on said first and said second language models,
6 if said preceding word has been judged to be a disfluency word in said step (d).

1 43. The storage medium according to claim 39, wherein said computer program is
2 designed to make the computer execute the additional step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 44. The storage medium according to claim 40, wherein said computer program is
2 designed to make the computer execute the additional step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 45. The storage medium according to claim 41, wherein said computer program is
2 designed to make the computer execute the additional step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 46. The storage medium according to claim 42, wherein said computer program is
2 designed to make the computer execute the additional step of:

3 calculating said probability based on said second language model, if said
4 preceding word has been judged as not being a disfluency word in said step (d).

1 47. An apparatus for speech recognition comprising:

2 an acoustic processing apparatus for converting analog speech input signals into
3 digital signals;

4 a first storage apparatus for storing an acoustic model which has learned voice
5 characteristics;

6 a second storage apparatus for storing a dictionary comprising a first language
7 model which has been trained regarding disfluency words and non-disfluency words,
8 and a second language model which has been trained regarding non-disfluency words
9 and trained to ignore disfluency words; and

10 an apparatus, connected with said acoustic processing apparatus and said first
11 and second storage apparatuses, for calculating a probability regarding said digital
12 signals using said acoustic models and said dictionary to recognize words showing the
13 highest probability of representing said input signals.

1 48. A computer system, comprising:

2 an input apparatus for inputting analog speech;

3 a converting apparatus connected with said input apparatus for converting said
4 analog speech into digital signals;

5 a first storage apparatus for storing an acoustic model which has learned voice
6 characteristics;

7 a second storage apparatus for storing a dictionary comprising a first language
8 model which has been trained regarding disfluency words and non-disfluency words,

10 and trained to ignore disfluency words;

11 an apparatus, connected with said converting apparatus and said first and
12 second storage apparatuses, for calculating a probability regarding said digital signals
13 using said acoustic model and said dictionary to recognize words showing the highest
14 probability of representing said analog speech; and

15 a display apparatus for displaying the results of said recognition.

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